

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

a' sub 17

1. (Currently amended) A method for using empirical measurements of accesses to synchronization points within an application to construct a performance model for the application, comprising:

modifying the application to record statistics related to the synchronization points within the application;

running the application to produce the statistics related to synchronization points;

constructing the performance model based upon the statistics, wherein the performance model is a queuing system model in which synchronization points in the application are represented by service centers in the queuing system model;

and

using the performance model to predict a performance of the application.

2. (Original) The method of claim 1,

wherein constructing the performance model based upon the statistics involves constructing an analytic model for the application; and

wherein using the performance model to predict the performance involves numerically solving the analytic model to predict the performance for the application.

3. (Original) The method of claim 1,

2 wherein constructing the performance model based upon the statistics
3 involves constructing a simulation model for the application; and
4 wherein using the performance model to predict the performance involves
5 running the simulation model to predict the performance for the application.

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1 4. (Original) The method of claim 1, wherein modifying the application
2 involves compiling the application with a profiling option in order to record the
3 statistics related to the synchronization points.

1 5. (Original) The method of claim 1, wherein modifying the application
2 involves modifying the executable code of the application to record the statistics
3 during system calls that operate on the synchronization points.

1 6. (Original) The method of claim 1, wherein the statistics include:
2 an identifier for a calling function;
3 an identifier for a mutual exclusion variable;
4 a time spent holding the mutual exclusion variable; and
5 a frequency of accesses to the mutual exclusion variable.

1 7. (Original) The method of claim 1, wherein the statistics include a
2 directed call graph specifying an ordering of function calls.

1 8. (Original) The method of claim 7, wherein constructing the performance
2 model involves constructing a queuing model, wherein each synchronization point
3 is a service center for jobs representing processes that circulate between service
4 centers in a manner specified by the directed call graph.

a' 1 9. (Currently amended) A computer-readable storage medium storing
2 instructions that when executed by a computer cause the computer to perform a
3 method for using empirical measurements of accesses to synchronization points
4 within an application to construct a performance model for the application, the
5 method comprising:
6 modifying the application to record statistics related to the synchronization
7 points within the application;
8 running the application to produce the statistics related to synchronization
9 points;
10 constructing the performance model based upon the statistics, wherein the
11 performance model is a queuing system model in which synchronization points in
12 the application are represented by service centers in the queuing system model;
13 and
14 using the performance model to predict a performance of the application.

1 10. (Original) The computer-readable storage medium of claim 9,
2 wherein constructing the performance model based upon the statistics
3 involves constructing an analytic model for the application; and
4 wherein using the performance model to predict the performance involves
5 numerically solving the analytic model to predict the performance for the
6 application.

1 11. (Original) The computer-readable storage medium of claim 9,
2 wherein constructing the performance model based upon the statistics
3 involves constructing a simulation model for the application; and
4 wherein using the performance model to predict the performance involves
5 running the simulation model to predict the performance for the application.

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1 12. (Original) The computer-readable storage medium of claim 9, wherein
2 modifying the application involves compiling the application with a profiling
3 option in order to record the statistics related to the synchronization points.

1 13. (Original) The computer-readable storage medium of claim 9, wherein
2 modifying the application involves modifying the executable code of the
3 application to record the statistics during system calls that operate on the
4 synchronization points.

1 14. (Original) The computer-readable storage medium of claim 9, wherein
2 the statistics include:
3 an identifier for a calling function;
4 an identifier for a mutual exclusion variable;
5 a time spent holding the mutual exclusion variable; and
6 a frequency of accesses to the mutual exclusion variable.

1 15. (Original) The computer-readable storage medium of claim 9, wherein
2 the statistics include a directed call graph specifying an ordering of function calls.

1 16. (Original) The computer-readable storage medium of claim 15,
2 wherein constructing the performance model involves constructing a queuing
3 model, wherein each synchronization point is a service center for jobs
4 representing processes that circulate between service centers in a manner specified
5 by the directed call graph.

1 17. (Currently amended) An apparatus for using empirical measurements
2 of accesses to synchronization points within an application to construct a
3 performance model for the application, comprising:

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4 a modification mechanism that is configured to modify the application to
5 record statistics related to the synchronization points within the application;
6 an execution mechanism that is configured to run the application to
7 produce the statistics related to synchronization points;
8 a performance model construction mechanism that is configured to
9 construct the performance model based upon the statistics, wherein the
10 performance model is a queuing system model in which synchronization points in
11 the application are represented by service centers in the queuing system model;
12 and
13 a performance predicting mechanism that is configured to use the
14 performance model to predict a performance of the application.

1 18. (Original) The apparatus of claim 17,
2 wherein the performance model construction mechanism is configured to
3 construct an analytic model for the application; and
4 wherein the performance predicting mechanism is configured to predict
5 the performance of the application by numerically solving the analytic model.

1 19. (Original) The apparatus of claim 17,
2 wherein the performance model construction mechanism is configured to
3 construct a simulation model for the application; and
4 wherein the performance predicting mechanism is configured to predict
5 the performance of the application by running the simulation model.

1 20. (Original) The apparatus of claim 17, wherein the modification
2 mechanism is configured to compile the application with a profiling option in
3 order to record the statistics related to the synchronization points.

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1 21. (Original) The apparatus of claim 17, wherein the modification
2 mechanism is configured to modify the executable code of the application to
3 record the statistics during system calls that operate on the synchronization points.

1 22. (Original) The apparatus of claim 17, wherein the statistics include:
2 an identifier for a calling function;
3 an identifier for a mutual exclusion variable;
4 a time spent holding the mutual exclusion variable; and
5 a frequency of accesses to the mutual exclusion variable.

1 23. (Original) The apparatus of claim 17, wherein the statistics include a
2 directed call graph specifying an ordering of function calls.

1 24. (Original) The apparatus of claim 23, wherein the performance model
2 construction mechanism is configured to construct a queuing model, wherein each
3 synchronization point is a service center for jobs representing processes that
4 circulate between service centers in a manner specified by the directed call graph.
